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Music as an Accompaniment to Physical Exercises



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MUSIC AS AN ACCOMPANIMENT TO PHYSICAL EXERCISES.*

JAKOB BOLIN, NEW YORK CITY.

In no country is the use of music in connection with physical exercise so extensive as in this. The Germans use it very much less than we do, and the Swedes even less than the Germans. But no school is opposed on principle to the use of it under every condition and circumstance. It has been repeatedly asserted that music as an accompaniment to exercises is absolutely condemned by the Swedes. This is not true, and can be stated only by those who have merely a superficial knowledge of the subject. But it is true that the Swedes consider that it is necessary to employ it with great discretion and that it is frequently very much abused to the detriment of both exercise and music. In this they have the hearty support of the Germans, who, however, do not limit the use of music quite as much as do the Swedes.

Music, according to its character, has been known from time immemorial to be a stimulant to action as well as a motor-depressing agency. It consequently does not matter much what this one or that one believes in regard to its usefulness in the gymnasium. Its strong influence upon bodily movements cannot be gainsaid, and it is our duty to ascertain, as far as we can, the nature of this influence, and the manner in which it varies under different conditions. As a matter of fact, we know very little definitely. The following facts seem to be all that have been established by definite experiments:

1. *The strength of a muscular contraction is increased by any sound made simultaneously with it.*

Thus if a person squeezes a dynamometer with all his power during silence and then repeats the same when a gong is sounded, or a note is struck on the piano, he will find a greater deflection of the indicator in the second case than in the first.

Observations of this kind are quoted in most handbooks on experimental psychology and may be verified by any person.

*Remarks made at a discussion before the New York Physical Education Society April, 1906.

2. *The increase in strength is not merely dependent on the existence of the sound, but also on its intensity, growing with the latter.*

Numerous observations on this point have been made. The most striking results are, as might be expected, gained in those subjects who are abnormally susceptible to nervous influences. Féré in experimenting on hysterics found such striking results, that I here quote them simply to show the extremes, and with the most positive assertion that fairly normal persons show nothing more than the tendency which in this case finds such a pregnant expression. By placing his subject, a hysterical woman, at various distances from a tuning fork, he secured

at a distance of 8 meters a contraction of 22 units			
" "	" "	7	" "
" "	" "	6	" "
" "	" "	5	" "
" "	" "	4	" "
" "	" "	3	" "
" "	" "	2	" "
" "	" "	1	" "
" "	" "	0	" "
			22
			24
			29
			32
			35
			45
			48
			52

3. *The intensity of the contraction is also a function of the pitch, so that the higher notes give stronger contractions than the lower ones.*

On the same kind of subject the same observer thus found:

Do gave a muscular contraction of 26 units			
Re	" "	" "	27
Mi	" "	" "	28
Fa	" "	" "	28
Sol	" "	" "	31
La	" "	" "	35
Si	" "	" "	38
Do	" "	" "	45

This also is, of course, quoted here merely to show the tendency, not the actual facts in normal people, such as those with whom we deal.

4. *A sound simultaneous with a muscular contraction not only increases its strength but also postpones the moment when further contractions are impossible because of fatigue.*

Observations on this point are similarly found in psychological literature.

5. From the same sources we gather that if the dynamometer be so arranged as to record not only the maximum pressure but the variations from moment to moment: *The steadiness of the*

muscular contraction will suffer considerably if a sound be made at the same time that the effort be made.

The increments in strength of the muscular contraction noted under the first four heads, I believe to be due to something akin to summation of stimuli, while I feel inclined to point to the unevenness in the fifth case, as an experimental proof of the contention that music diverts the attention from the work at hand.

This, which I then assert to be a fact experimentally proven, is denied by many. Thus for instance, to quote from Dr. Fitz: "Practically there is little basis for this statement. Many teachers have found that greater attention is given to the exercises because of the music and the rhythmic demand created by it." It is easily understood that those who habitually use music should make this claim. They use music chiefly because of the ease with which they then hold the attention of the class. But I aver that this does not vitiate my statement to the contrary. I believe that the apparent discrepancy between their experiences and mine is not a real one but only depends on the different meaning of the word exercises as used by them and by me. There are two distinct factors which enter into the execution of an exercise; the element of form and of time. When they speak of music as an agency by which they succeed in holding the attention of the pupil more closely to the exercise, they mean to its time element, while I am more interested in its form. No one denies or can deny that music enables the student more easily to follow a given rhythm. But this stronger attention to the time is just exactly the reason why less attention is paid to the form. It is a general psychic law that only one thing at a time can be in the focus of attention.

6. *Different melodies affect movements differently, according to the intervals in the octave, those in the major key being stimulating, those in the minor key being depressing.*

Scripture, for instance, found that he could exert a maximum pressure of eight pounds during silence, which was increased to eight and three-quarter pounds under the influence of the giant's motive from the Rheingold, and decreased to seven and a half pounds by the slumber motive from the Walkure.

These are, so far as I know, all the facts which have been established by experiments. I bring them forth not to serve as the basis for deductions, but in order that thereby may perhaps be explained the experiences that we have gathered in our practical work. Let us try to state these experiences.

1. It is the habit of many an athletic trainer when he is anxious that those under his care shall do their very best in a pole vault, a jump, or some similar event to cry out at the very moment that the contestant shall make his greatest effort an encouraging "lift," "up," "get over," or something of that nature. The gymnastic teacher frequently does the same thing not only in exercises of corresponding nature, but in almost any kind of exercise, when he finds that the necessary effort is not made. So, for example, if he finds that an exercise of several counts is not executed with the necessary strength, he will use a command or count to exactly correspond in time with the effort, not as a signal for it, nor for the mere checking off of the time, but in order to encourage a stronger muscular contraction. This beneficial effect, which, of course, corresponds to the first fact gained in the field of laboratory experimentation, is more pronounced if the added stimulus comes suddenly and unexpectedly. For this purpose then I believe that melodies are inferior to words, handclapping, stamping, or such sounds.

2. Every teacher who uses music as an accompaniment to the exercises finds it absolutely necessary when teaching a new combination, be it a series in club swinging or some fancy steps or an exercise of any kind whatever, to first teach it a few times without the accompaniment for the purpose of getting a semblance of form. Now, my opinion is, that this preliminary stage is generally altogether too short, with the result that the form usually is very much at fault. Be this as it may, this practice among those who use music is a recognition of the fact that the music makes impossible the attention to form, and I assert, therefore, unhesitatingly that wherever form is of the utmost importance, there musical accompaniment is an evil which must not be tolerated for a moment. Holding the opinion that in all truly gymnastic exercises, form is always of the utmost importance, for which time must be sacrificed, if both cannot at the same time be demanded with equal perfection, I see in this a very great limitation in the use of music in the gymnasium. When I, for instance, see classes making trunk bendings in the various directions, even in rather difficult starting postures to the accompaniment of music, I consider it as gymnastics only in the same sense that we may use that term for any kind of physical activity, as, for instance, woodchopping—a broadening of the term against which I have long warred.

It may, of course, be remarked that in thus setting a limit to gymnastics, I am on the wrong track, and that preferably such exercises should be chosen, which adapt themselves to a rhythmical execution. But this is of course another question,

to answer which lies outside of the purpose of this discussion. I may perhaps be permitted merely to call the attention of the enthusiasts for rhythmical exercises to the investigations of Demeny as to the effects of these exercises.

3. Every teacher finds that the time is better kept whenever there is an accompaniment.

Whenever we then have exercises in which the time element is of greater importance than the form, and these exercises naturally adapt themselves to a rhythmical execution, music is of great value. This is the case with marches and running. They are naturally rhythmical. They should be performed in a definite form, to be sure, but it is desirable to use them at such an early stage that the pupils have not yet acquired that amount of physical training which expresses itself in proper carriage, the correct movements of the legs, the maintenance of the straight ranks, and the proper distances between the individuals. During this time the time element may well receive the greater share of our attention, and music is to be strongly recommended, at least if the march or the running be somewhat prolonged.

But it is a decided mistake to draw the conclusion from this that music should always be used even in these exercises. Aside from the fact that there comes a time when we must lay stress on the form, we must not forget that we are not teaching these exercises for their use in the gymnasium but for life. We strive to give a method of locomotion by which the pupil shall learn to cover the greatest possible ground in the shortest time with the least expenditure of energy. Now, if we always teach with the accompaniment of music we make the students dependent upon this assistance and in their lives, when they do not have the music to fall back upon, they are at a loss and actually walk worse than without the instruction. An example of this is for instance the difficulty a class, which has been trained exclusively in the gymnasium, has in marching on the turf. Whether they have had music or not, they always have the utmost difficulty in keeping step. The reason for this, I take it, is that their steps on the hard gymnasium floor give the necessary accompaniment, and when this is withdrawn, they find themselves under such new conditions that it takes a longer time to adjust themselves to these conditions, than it does if they have had no previous training.

4. Again, I think the experience of the teachers tells us that when an exercise has been thoroughly ingrained so as to be second nature, and when it consequently is impossible to change its form without a special act of will, music does not divert the attention from the form, but is of value, in as much as it gives

a general impetus to movement. Under these conditions, the music is not needed for the sake of the rhythm, but is valuable probably because it postpones fatigue. It is the influence we saw from the giant's motive upon Professor Scripture. It is the influence of the Marseillaise upon the French revolutionists. It is the influence of "John Brown" and "Marching Through Georgia" upon our soldiers during the Civil War. It is the value of music at our balls, without which the dancers certainly could not hold out a whole night.

For this influence we may properly use music in the marches and running of the well trained gymnasts, as also at excursions and the like. Without approving memorized drills, I wish to say that if we use them, as is frequently the case in exercises with portable apparatus, Indian clubs, dumbbells, wands, etc., or in fancy steps, dances and so on, music is permissible when the form has been so mastered that no serious mistakes in this regard are committed.

5. Music may furthermore be used with advantage in such exercises, which while not necessarily rhythmic in character are more or less consecutive, and of such a nature that they approach the sports, games and plays. Such are climbing, vaulting, tumbling, various exercises on the parallel and the horizontal bars, etc. This group approaches closely the memorized drills just spoken of. In their completed forms they do not consist of distinct, well defined movements, following each other in a given cadence; but one movement passes imperceptibly over into the next phase. It is not possible that the rhythm of the music shall impress itself on the exercise to its detriment, destroying its natural sequence or form, but, by the general stimulus more strength will be developed in the execution, more endurance, more general ability.

But even here certain precautions should be taken. The gymnasium must not be a circus, but if we can learn from the latter, it is certainly permissible. Have you noticed that the circus performers on double trapeze do their work to the accompaniment of music, but that the latter is interrupted just when they are going to fly off into space? I do not know why this is so, but I imagine that they have found that in the dangerous moment they cannot afford to be disturbed by any outside stimulus.

One writer who does not recommend music for daily use in the gymnasium, defends it for exhibitions on the plea that "when the gymnastic work of the schoolroom or the gymnasium is to be exhibited before the public eye, it must be presented in a different way from that of the everyday routine," in a manner which is pleasing and attractive. This is a view that ought to

be deprecated. It savors too much of the circus and the vaudeville stage. When work is shown to the public, it should be shown exactly as it is taught. It should be a sample of the routine work. It should not be specially prepared and decked out in ornaments to attract the unthinking by false pretenses. The gymnastic material should not be arranged any more "thoughtfully and artistically" during exhibitions than during the everyday lesson. The everyday lesson is of more importance than the exhibition, the pupil of more importance than the onlookers. Nothing extra "must be taken into consideration to produce the desired effect" upon the latter. They should be made welcome to see the work as it is actually given. If they demand something beyond this, they should be referred to the places of amusements, where, for a fee, everything is done to supply a feast for their eyes.

I have hitherto spoken of instrumental music, and it is of course that which we have chiefly in our minds when we approach this problem. But a few words may perhaps be devoted to the use of vocal music. The question whether song is to be permitted in the gymnasium is legitimate in as much as some teachers encourage their pupils to sing during the exercises.

Without entering into a lengthy discussion of the matter, we may perhaps easily agree that wherever instrumental music is out of place, there the use of vocal music cannot be defended. But its use is still further limited. It may properly be employed in marches and certain rhythmical exercises, like the milder forms of ringdances for children, and the like. But it must not be utilized during exercises involving effort, nor when the respiration is labored, nor when movements of the arms or trunk make special demands on thoracic dilatation. To recommend singing during wrestling and boxing, as one enthusiast has done, is of course the height of absurdity.

One director at least has recommended that a part of the class shall sing while the other part works. If this be intended as a rare occurrence to be used, say once a month or less frequently, for the sake of introducing variety, joy, and pleasure, it is of course an excellent thing. But if it be made a practice more or less habitual, the mildest form of criticism to pass upon it is that it is vicious in the extreme. The time of the lesson should be devoted to physical training, which means that all the pupils shall be kept busy, if possible, during the whole lesson. One of the objections to such apparatus as parallel and horizontal bars is that, as a rule, only one pupil can be accommodated on each piece at a time and in large classes it is, therefore, extremely difficult to so arrange the lesson as not to

leave the majority of the pupils idle a large part of the time. We must, therefore, well beware of any schemes which will tend to increase the period of idleness. If it now be remarked that even with the very best choice and arrangement of the apparatus and the most careful preparation of the lesson, there will always be some time when the pupils or part of them are not occupied, we simply retort that those periods must be made to coincide with the necessity of the pupils for physical rest, that is when, because of previous work, their respiration is somewhat labored and their heart activity raised, and that is consequently the time of all times when they should not be made to sing.

